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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPLICANT(s): Schmutz et al.

SERIAL NO.: 09/600,879

ART UNIT: 3652

FILING DATE: 8/14/2000

EXAMINER: J. Keenan

TITLE: DEVICE FOR LOADING SUBSTRATES INTO AND
UNLOADING THEM FROM A CLEAN ROOM

ATTORNEY

DOCKET NO.: 390-010778-US (PCT)

Commissioner of Patents

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ATTENTION: BOARD OF PATENT APPEALS AND INTERFERENCES

APPELLANTS' BRIEF

(37 C.F.R. §1.192)

This is an appeal from the final rejection of the claims in the above-identified application. A Notice of Appeal was mailed on June 8, 2004. The fees required under 37 C.F.R. §1.17 are being submitted herewith. This brief is being submitted in triplicate. The appendix of claims are attached hereto.

I. REAL PARTY IN INTEREST

The real party in interest is Brooks Automation, Inc, a Delaware Corporation with offices at 15 Elisabeth Drive, Chelmsford, MA.

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II. RELATED APPEALS AND INTERFERENCES

There are no directly related appeals or interferences regarding this application.

III. STATUS OF CLAIMS

Claims 22-42 are pending in the application. Claims 35-36 and 38-40 have been allowed. Claims 22-34, 37 and 41-42 have been finally rejected. The rejection of Claims 22-34, 37 and 41 is being appealed.

IV. STATUS OF AMENDMENTS

An amendment was filed on March 8, 2004, after the final rejection. The amendment has been entered. Another amendment after the final rejection was filed on August 9, 2004 in conjunction with this brief. The August 9 amendment cancels claim 42.

V. SUMMARY OF INVENTION

As described on page 5, lines 6-22, and page 6, lines 1-6 of the substitute specification (mailed May 14, 2002) in the instant application, the present invention according to the exemplary embodiments, relates to a device 10 for loading or unloading substrates into/out of a clean room 12. The device 10 has a lock device 14 (with a closable door 49) and an adapter device 20, as seen best in Fig. 1, that interfaces the lock device 14 with the clean room frame. The lock device 14 has a base plate that is held on the clean room frame, such as with fastening screws 34 (see also Fig. 2). The orientation or alignment of the adapter base plate 25 is adjustable (both horizontally and vertically) relative to the clean room frame 26, such as with

forcing screws 27 and 29. The forcing screws 27, 29 between the adapter base plate 25 and clean room frame 26 allow the adapter base plate to be adjustably displaceable (both vertically and horizontally) relative to the clean room frame 26. Base plate 25 has indexing pins 32 that are received in corresponding bores of lock device 14, with essentially no free-play between the pins and bores, for removably mounting the lock device 14 on the alignable adapter 14. Amongst other features the lock device has a displaceable receiving table 45 for a transport box and a roller track 75 as shown in Fig. 1.

VI. ISSUES

1. Are Claims 22-27 unpatentable under 35 U.S.C. 102 as being anticipated by Bonora et al. (US 6,220,808; hereinafter Bonora)?
2. Are Claims 28-29 and 41-42 unpatentable under 35 U.S.C 103 as being obvious over Bonora?

VII. GROUPING OF CLAIMS

The claims do not stand or fall together.

The claims are grouped as follows:

Group 1 - Claims 22-23, 26-27, 30-34 and 37

Group 2 - Claim 24-25

Group 3 - Claim 28-29

Group 4 - Claim 41

In accordance with 37 C.F.R. §1.192(c)(7), an explanation of why the claims of the groups are believed to be separately patentable is contained in the Argument section below.

VIII. ARGUMENT

B:1. Claim 22 is not anticipated by Bonora.

Claim 22 calls for the adapter device being held on the processing installation and adjustably oriented relative to the processing installation and the lock device being releasably fastened on the adapter device. Bonora fails to anticipate these features. Bonora fails to disclose both that the adapter has an adjustable orientation to the processing installation and that the lock device is releasably fastened to the adapter.

In col. 6, lines 20-45, Bonora discloses a "tilt and go" attachment system 25 and an adapter plate 27 between the load port 24 and BOLTS interface 22 of the process tool 20. This is shown in Fig. 1A. The "tilt and go" attachment 25 is disclosed in Bonora (U.S. Patent No. 6,138,721, hereinafter Bonora '721), Figs. 2-4. As seen in the aforementioned figures, the "tilt and go" attachment 25 includes a fixed plate 16 on the BOLTS interface with a ball and socket connection assembly between plate 16 and the load port interface assembly 10. In Fig. 1A, Bonora shows the plate of the "tilt and go" attachment 25 to be fixedly mounted to the BOLTS interface 22 of the processing tool 20 (similar to what is shown for plate 16 in Fig. 2 of Bonora '721). Bonora fails to expressly disclose whether the ball and socket connection assembly (i.e. the assembly shown in Figs. 3-5 of Bonora '721) engages directly with the load port assembly 24 (as in Bonora '721) or with the adapter plate 27 (in a manner similar to that shown in Bonora '721 but with adapter plate 27 of Bonora '808 in place of the load port plate 10 in Bonora '721). It appears, from col. 6, lines 29-33, of Bonora that either configuration

may be possible, but neither configuration anticipates the features called for in claim 22.

In col. 6, lines 30-34, Bonora discloses that the adapter plate 27 may be provided as part of a particular load port 24. In that case, the "tilt and go" attachment 25 (fixed to the processing tool) engages the adapter plate 27 itself, or some other bottom portion of the load port 24 of which the adapter plate is part. This provides the adapter plate 27 with an adjustable orientation relative to the processing tool 20, but there is absolutely no indication whatsoever that in this case the load port 24 is releasably fastened to the adapter plate 27 which is part of the load port itself. Bonora does not disclose anything about the fastening system or manner by which the adapter plate 27 and load port 24 are fastened to each other (the bolts or screws shown in Fig. 1A clearly are only used for holding the adapter plate 27 on the BOLTS interface 22 of the processing tool 20, the fasteners being shown as passing through only the adapter plate 27 before entering the fastening holes in the BOLTS interface 22). If the adapter plate 27 is part of the load port, a non-releasable fastening system (i.e. bonding, brazing, spot welding or other non-releasable fastening) may be used to attach the adapter plate 27 to the rest of the load port 24. Indeed, it appears that may be the case because if the adapter plate 27 is part of the load port 24, and as indicated in col. 6, lines 46-48 of Bonora '808, the adapter plate 27 makes use of the "tilt and go" attachment system in Bonora '721, including the locking tabs 44 shown in Bonora '721 Figs. 7-9, a releasable fastening between the adapter plate 27 and the rest of the load port of which it is part appears to be duplicative and unnecessary. The locking tabs 44 in Bonora '721 provide for

attachment of the load port assembly 10, (i.e. the adapter plate 27) to the processing tool, as well as for roll and azimuth adjustment between the (load port) load port adapter plate 27 and processing tool. This means that fastening and orientation adjustment of the load port to the processing tool 20 is accomplished simultaneously by the lock tabs 44 at the interface between adapter plate 27 and processing tool 20. Not only does Bonora '808 and Bonora '721 fail to disclose, in the case of the adapter plate 27 being part of the load port itself, a releasable fastening system for the load port to the adapter plate, but they also fail to disclose any motivation for releasably fastening the load port and adapter plate forming part of the load port.

On the other hand, if the adapter plate 27 is provided as part of the BOLTS interface of the processing tool 20, as disclosed in col. 6, lines 34-35 of Bonora '808, then clearly the load port 24 would be releasably fastened to the adapter plate. However, in that case, as the adapter plate 27 is part of the BOLTS interface, it would appear that the adapter plate 27 is fixed and not adjustably oriented relative to the processing tool 20. Moreover, the "tilt and go" attachment system of Bonora '721 would appear to be incorporated into the load port assembly 24 and the adapter plate 27 (part of BOLTS interface 22) precisely as disclosed in Bonora '721. In that case, the load port 24 (not the adapter device 27) would have an adjustable orientation relative to the processing tool (i.e. adapter plate 27) and be releasably fastened to the adapter plate. Bonora '808 fails to disclose, that in the case where the attachment plate 27 is part of the BOLTS interface 22 (i.e. part of the processing tool 20), the adapter plate 27 is adjustably oriented relative to the BOLTS interface 22. Indeed,

in this case (i.e. adapter plate 27 is part of the processing tool BOLTS interface 22) there would be no desire, much less a need (i.e. it would not be necessary), for the adapter plate 27 to be adjustably oriented relative to the BOLTS interface (of which it is part), because orientation adjustment is provided to the load port 24 by the "tilt and go" attachment system attaching the load port 24 to the adapter plate 27 (i.e. as per Bonora '721). Thus, in this case the adapter plate 27 in Bonora '808 does not appear to be, and does not need to be, rotatably oriented relative to the processing tool because the load port 24 is adjustably oriented relative to the adapter plate 27. (i.e. this is substantially similar but opposite to the previously described case where the adapter plate 27 is part of the load port assembly 24 (where the adapter plate is adjustable relative to the processing tool but fixed (and thus not necessarily releasably mounted) to the load port). In other words, if the load port 24 in Bonora '808 is adjustably oriented (with the "tilt and go" attachment system) relative to the adapter plate 27 that is part of the interface of the processing tool 20, then having adjustable orientation of the adapter plate 27 relative to the processing tool 20 in Bonora '808 is not desired or needed. Bonora '808 fails to disclose (both) the adapter device being held on and adjustably oriented relative to the processing installation and the lock device being releasably fastened on the adapter device as otherwise called for in claim 22. Bonora '808 does not disclose the features recited in claim 22. The Examiner's rejection of claim 22 based on Bonora should be reversed.

2. Claim 24 is not anticipated by Bonora.

Claim 24 calls for the adapter device having an underside with two spaced apart, height adjustable forcing screws which are held on the stationary element. Bonora fails to anticipate this. Bonora incorporates Bonora '721 by reference. In Figs. 3-4, Bonora '721 discloses a ball joint 14 threaded into plate 16 on the BOLTS interface. A lateral adjustment plate 24, mounted to the load port 26, is seated on the ball of the ball joint. Thus, in Bonora, in the case where the load port adapter plate 27 is part of the load port assembly, it is the BOLTS interface 22 on the processing tool 20 that has one (not two) vertically adjustable ball joint pin 14 (as per Bonora '721). The adapter plate, being part of the load port assembly merely has the lateral adjustment plate 24 (as per Bonora '721) and no height adjustable forcing screws. In the case, where the adapter plate 27 in Bonora is part of the BOLTS interface the adapter plate has again but one vertically adjustable ball joint pin 14 (see Bonora '721), but here the vertically adjustable pin which extends upwards from top of plate 16 is not in an underside of the Bonora adapter plate 27. Bonora fails to disclose the adapter device having an underside with a height adjustable screw, much less two spaced apart, height adjustable forcing screws. The ball joint pin 14 in Bonora '721 is not a forcing screw. The ball joint pin 14 does not force adjustment. Rather, the height of the ball joint pin 14 is established (by threading the pin into/out of plate 16) and set with set screw 32 before the load port is seated on the ball joint. Further, the single ball joint pin 14 in Bonora is not the equivalent of two spaced apart height adjustable forcing screws. For example, two spaced apart height adjustable forcing screws are capable of adjusting both height and inclination/pitch of an object supported therefrom. A single height adjustable screw, such as

the ball joint pin 14 in Bonora, cannot. Bonora fails to disclose the adapter device having an underside with two spaced apart, height adjustable forcing screws which are held on the stationary element as called for in claim 24. Bonora does not anticipate the features of claim 24, and the Examiner's rejection of claim 24 based on Bonora should be reversed.

3. Claim 28 is not obvious over Bonora

In addition to the features of claim 22, claim 28 recites that the lock device has a plurality of receiving bores, and the adapter device includes indexing pins plugged into a respective one of the receiving bores, the indexing pin being fittingly and essentially free of play when plugged into the respective receiving bore. This is not disclosed or suggested in Bonora.

As noted before, Bonora fails to disclose any details of the attachment of the adapter device to the load port. The Examiner appears to agree with this in section 4 of the Action. Nevertheless the Examiner states that it would have been obvious as a matter of mere design choice, to modify the Bonora to provide a system as called for in claim 28. The failure of Bonora to disclose any kind of fastening system whatsoever for fastening the load port to the adapter plate does not make anything obvious to one skilled in the art, and does not provide license to the Examiner to use a fastening system on the basis of the Applicant's own disclosure to correct a defect in the cited prior art. The failure, of the prior art, to disclose anything is not a disclosure or suggestion of any kind. Moreover, in this case the system called for in claim 28 is clearly not obvious from anything disclosed in Bonora. As noted before, Bonora discloses one case where the adapter plate 27 is

part of the load port 24. Here, any connection system may be used between load port and adapter plate such as bonding, spot welding, brazing, staking or even conventional clearance bolts. In contrast, the features in claim 28 of the lock device having a plurality of receiving bores, the adapter including indexing pins plugged into corresponding bores with the indexing pins being fitted essentially free of play when plugged into the bores are not a matter of mere design choice to the aforementioned connection systems. On the contrary, providing the lock device with receiving bores and the adapter with indexing pins fitted essentially without play to the receiving bores allows the lock device to be removed and replaced freely from the processing tool ensuring that upon installation of the replacement lock device, desired alignment to the processing tool is repeatably achieved thereby avoiding a realigning operation each time a load port is replaced. This is not disclosed or suggested anywhere in Bonora. If fixed to the load port (such as by a permanent fastening system) there is no need or desire for the adapter to have indexing pins to be received without play in load port bores. Even in the case where the adapter plate is part of or fixed to the BOLTS interface of the processing tool, it appears from Bonora that the load port includes the "tilt and go" system of Bonora '721 for adjusting the orientation of the load port to the processing. This again precludes the features called for in claim 28, as the disclosure in Bonora provides for adjusting the orientation of the load port relative to the adapter plate (as evidenced by the clearance around pins 48 (see Fig. 9 of Bonora '721) in the load port plate 26 and locking tab 44) which (contrary to what Bonora sets out to do) cannot be accomplished using fitted indexing pins with substantially no free play as called for in claim 28.

Claim 28 calls for features that provide for a rapid and repeatable replacement of load ports which is not disclosed or suggested in Bonora. Claim 28 is not obvious over Bonora. The rejection of claim 28 based on Bonora should be reversed.

4. Claim 41 is not obvious over Bonora.

In addition to the features of claim 22, claim 41 calls for at least one crank drive, the lock device including a roller track and a receiving table, wherein closing movement of the (lock device) lock door, displacement movement of the receiving table, and lowering movement of the roller track are derived from the at least one crank drive. Bonora fails to disclose or suggest a crank drive, fails to disclose or suggest that the lock device includes (both) a roller track and a receiving table, and fails to disclose or suggest that closing movement of the lock door, displacement movement of the receiving table, and lowering movement of the roller track are derived from the at least one crank drive.

In Figs. 3 and 6-7, Bonora discloses lead screws 56, engaging threaded holes in carriages 54, and rotated by stepper motors (see col. 8, lines 20-25) for moving outer support plate 30. In col. 9, lines 5-10, Bonora further discloses an indexer (not shown) for translating support plate 28 independent of support plate 30. Finally, in Fig. 8 Bonora discloses a tilting mechanism (referenced as (80) in Fig. 8 but listed as (81) in col. 12, line 66) capable of tilting the support plate 69. Bonora discloses no other drives, and none of the disclosed drives are crank drives or would make it obvious to one skilled in the art to modify Bonora to use at least one crank drive. A drive, such as disclosed in Bonora, having a lead screw powered


by a stepper motor is not the same, either functionally or structurally as a crank drive. For example, the lead screw drive does not employ a crank. Further, though both lead screw and crank drives are used to transform rotational motion to linear/translational motion, the resultant linear motion is different for each type of drive (e.g. crank drive has a sinusoidal effect not existent with a lead screw drive). The indexer drive also disclosed in Bonora is generally similar to the lead screw drive (providing as a drive a substantially steady resultant linear motion). Hence, the indexer drive is also not the same, or equivalent to the crank drive. Lastly, the bare mention of a tilting mechanism 81 capable of tilting the support plate in Bonora would not make it obvious for one skilled in the art from Bonora alone to employ a crank drive to move the support plates in Bonora. There are many kind of drives, such as a simple rotation drive with a rotating shaft through the support plate pivot axis, that are capable of tilting the support plate. Moreover a drive capable of tilting the support plate, would not be used in and as of itself to replace the lead screw drive or indexer drive for providing the linear motion to the Bonora support plates. There is nothing whatsoever in Bonora to suggest to one skilled in the art to use a crank drive for moving the support plates in Bonora.

Further, Bonora fails to disclose a roller track of any kind, or anything akin to a roller track. Further still, as noted before, there is no disclosure or suggestion in Bonora, that closing movement of the lock door, displacement movement of the receiving table, and lowering movement of the roller track are derived from at least one crank drive. The Examiner's reliance on obvious design expediciencies when there is simply no

suggestion whatsoever in Bonora, or anything else cited by the Examiner, of the differences between the features recited in the claim and the disclosure in Bonora being only matters of merely design choice, is improper and indicative of improper use of hindsight. Claim 41 is not obvious over Bonora. The rejection of claim 41 based on Bonora should be reversed.

A check in the amount of \$330 is enclosed herewith for the appeal brief fee. The Commissioner is hereby authorized to charge payment for any additional fees associated with this communication or credit any over payment to Deposit Account No. 16-1350.

Respectfully submitted,



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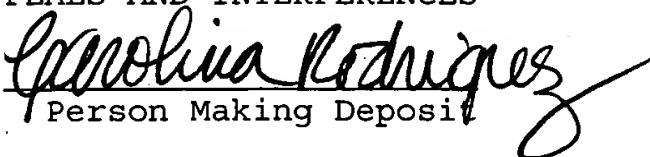
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IX. APPENDIX OF CLAIMS

The texts of the claims involved in the appeal are:

22. A device for loading or unloading substrates into or out of a clean room, comprising:

a lock device provided with a hermetically sealable lock opening which provides access to the clean room;

a transport box having substrates situated therein, said transport box being received on said lock device for movement through said hermetically sealable lock opening into or out of the clean room;

a processing installation adjoining said hermetically sealable lock opening; and

an adapter device arranged between said processing installation and said lock device, and being held on said processing installation and adjustably oriented relative thereto, said lock device being releasably fastened on said adapter device.

23. The device as defined in claim 22, wherein said adapter device includes means for adjusting said adapter device according to one of: height with respect to said processing installation, inclination with respect to a vertical axis defined by the device for loading or unloading substrates, inclination with respect to a horizontal axis defined by the device for loading or unloading substrates, and displacement

relative to at least one of said vertical axis and said horizontal axis.

24. The device as defined in claim 22, wherein said processing installation includes a stationary element, and wherein said adapter device has an underside with two spaced apart, height-adjustable forcing screws which are held on said stationary element.

25. The device as defined in claim 24, wherein said adapter device is seated and displaceable on said stationary element according to at least one of: longitudinally and transversely.

26. The device as defined as in claim 22, wherein said adapter device is provided with a plurality of adjustable forcing screws which engage said processing installation.

27. The device as defined in claim 22, further comprising:

fastening screws for fixing in place said adapter device relative to said processing device, and wherein said adapter device includes bores through which a respective one of said fastening screws passes, said bores having a diameter which is larger than that of said fastening screws.

28. The device as defined in claim 22, wherein said lock device has a plurality of receiving bores, and wherein said adapter device includes spaced apart indexing pins plugged into a respective one of said receiving bores, said indexing pin

being fittingly and essentially free of play when plugged into a respective one of said receiving bores.

29. The device as defined in claim 28, wherein said lock device includes a base plate which has a bore pattern corresponding to the arrangement of said indexing pins.

30. The device as defined in claim 22, wherein said lock device has a displaceable receiving table for said transport box, and a roller track in the area of said receiving table.

31. The device as defined in claim 30, wherein said roller track is pivotable through an angle of about 180° around a vertical axis defined by the device for loading or unloading substrates.

32. The device as defined in claim 30, wherein said roller track is provided with vertically upwardly extending lateral insertion slopes.

33. The device as defined in claim 30, wherein said roller track has a stop, and is slightly inclined in the direction toward one of: said processing installation and a loading and unloading level.

34. The device as defined in claim 30, wherein said roller track includes two parallel track elements which extend on both sides of said receiving table, and a connecting hoop which connects said track elements.

35. A device for loading or unloading substrates into or out of a clean room, comprising:

a lock device provided with a hermetically sealable lock opening which provides access to the clean room;

a transport box having substrates situated therein, said transport box being received on said lock device for movement through said hermetically sealable lock opening into or out of the clean room;

a processing installation adjoining said hermetically sealable lock opening; and

an adapter device arranged between said processing installation and said lock device, and being held on said processing installation and adjustably oriented relative thereto, said lock device being releasably fastened on said adapter device, wherein said lock device has a displaceable receiving table for said transport box, and a roller track in the area of said receiving table, wherein said roller track includes two parallel track elements which extend on both sides of said receiving table, and a connecting hoop which connects said track elements, and

wherein said roller track further includes a lever and a vertical shaft, and wherein said connecting hoop is connected with said lever, whose other end is pivotably maintained on said vertical shaft.

36. The device as defined in claim 35, wherein one of: said lever and said pivot shaft, are displaceable in height.

37. The device as defined in claim 30, wherein said roller track can be raised and lowered with respect to said receiving table.

38. A device for loading or unloading substrates into or out of a clean room comprising:

a lock device provided with a hermetically sealable lock opening which provides access to the clean room;

a transport box having substrates situated therein, said transport box being received on said lock device for movement through said hermetically sealable lock opening into or out of the clean room;

a processing installation adjoining said hermetically sealable lock opening; and

an adapter device arranged between said processing installation and said lock device, and being held on said processing installation and adjustably oriented relative thereto, said lock device being releasably fastened on said adapter device, and

a lock door including a cover for said transport box, wherein said cover is provided with two T-shaped keys, which can be rotated by means of a parallelogram drive maintained in said lock door, and wherein said lock opening is hermetically sealed by means of said lock door, said lock door being connected to said cover.

39. The device as defined in claim 38, further comprising:

a clutch disk; and

a motor-driven worm gear, wherein said clutch disk is connected with said parallelogram drive, and wherein said parallelogram drive is moved by said motor-driven worm gear.

40. The device as defined in claim 38, wherein said parallelogram drive has a hinged connecting rod from which a manual lever projects, said manual lever being accessible from the outside of the device for loading or unloading substrates.

41. The device as defined in claim 22, further comprising:

at least one crank drive; and

a lock door, wherein said lock device includes a roller track and a receiving table, and wherein closing movement of said lock door, displacement movement of said receiving table, and lowering movement of said roller track are derived from said at least one crank drive.

42. The device as defined in claim 41, wherein closing movement of said lock door, the displacement movement of said receiving table, and the lowering movement of said roller track and said lock door are arranged inside said lock device.